⑦ JP 09-130596 A

CLAIMS

[Claim(s)]
[Claim 1] A means to read a manuscript image, and a means to identify the alphabetic character section and the photograph section among the image data outputted by reading with this means to read, A means to thin out and process the image data outputted from said means to read, In the image processing system which has a means to display the image data which thins out and is outputted from means concerned to process, and changes said processing of a means to thin out and process, according to the output of said means to identify While thinning out and thinning [main scanning direction] out said means to process, in 1/n (n is a positive integer) about 1/m (m is a positive integer) and the direction of vertical scanning When said means to identify identifies the inside of the block of the matrix of mxn as it is an alphabetic character and larger data than a predetermined value exist beyond an appointed number within said block The means which transposes the central value of said block to maximum, and transposes the central value of said block to 0 when there is less said data than an appointed number, If said means to identify identifies the inside of the block of the matrix of mxn as it is a photograph, it will have the means which makes central value the result of having smoothed the data of said block. Thin out and said means to process The image processing system characterized by having embraced the alphabetic character or the discernment condition of a photograph, shifting, and outputting that central value.
[Claim 2] A means to read a color picture, and a means to carry out color correction processing and to change the RGB data read with the means concerned to read into YMCK, In the image processing system which it is outputted for every color from means concerned to change, and is outputted to edit processing, gradation processing, and the written-in means that carries out printer gamma amendment processing A means to display the color picture processed by the image read with said means to read, or said each processing, It is the image processing system characterized by having a means to dedicate and process the data width of face of 3 classification by color to the data width of face of one color, and to output to said means to display after carrying out color correction processing with said means to change, in case it displays on said means to display.
[Claim 3] A means to read a color picture, and a means to carry out color correction processing and to change the RGB data read with the means concerned to read into YMCK, In the image processing system which it is outputted for every color from means concerned to change, and is outputted to edit processing, gradation processing, and the written-in means that carries out printer gamma amendment processing The image processing system characterized by having a means to display the color picture processed by the image read with said means to read, or said each processing, and a means to choose whether said color picture is displayed by the color picture, or it displays by monochrome image.
[Claim 4] The image processing system according to claim 3 characterized by replacing and outputting the changed color to a tone when it has a means to match a tone with the color changed by said means to change and the display of monochrome image is chosen by said means to choose.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the image processing system equipped with the
image display device which displays a reading image.
[0002]
[Description of the Prior Art] There are some which are called infanticide processing by one of
the image processings in this kind of image processing system. That is, since the resolution of
CRT is low compared with image formation equipment when displaying the image generally read
with the image reader on CRT, infanticide processing is performed. In this case, the binary-ized
input according [an alphabetic character image] to a fixed threshold is performed, and the
binary-ized input by the dither method is performed in a photograph. Therefore, when the image
by which the alphabetic character image and the photograph were intermingled performed
infanticide processing, there was a problem that either became hard to see. so, to JP,63-
258162,A A means to identify an alphabetic character field and a photograph field among the
image information inputted as an image input means to input image information, It has an
infanticide means to perform infanticide processing of the inputted image information, and a
display means to display the image information outputted by the infanticide means concerned,
and the image display device characterized by changing the infanticide art by said infanticide
means according to the output of said discernment means is indicated. with this equipment,
when specifically thinning out and displaying, the alphabetic character section is processed by 1
bitwise by the fixed threshold method, and the photograph section processes the block of 4x4
(main - secondary — case it thins out to one fourth) with a dither method.
[0003] Moreover, a network other than the image-processing network of writing is prepared from
reading, image display is performed and only one side of a full color display or a mono-
electrochromatic display is prepared as an image display device, but in the case of mono-color
display, it is set up so that what carried out color conversion may be displayed on a mono-
electrochromatic display as it is.
[0004]
[Problem(s) to be Solved by the Invention] By the way, with said conventional technique, when
thinning out and displaying, the alphabetic character section is processed by 1 bitwise by the
fixed threshold method, and the photograph section is processing the block of 4x4 (when thinning
out a main scanning direction and the direction of vertical scanning to one fourth) with the dither
method. However, if the alphabetic character section is processed by 1 bitwise by the fixed
threshold method, when thinning out to one fourth, for example in the Lord and the direction of
vertical scanning, one of 16 pixels (4x4) is processed, since the 15 remaining pieces do not see,
a thin line becomes fragmentary and they become hard to see. Moreover, the dither method is
used for the photograph section. However, the dither method is effective when using for area
gradation, but when deciding the central value of 4x4 blocks, there is little effectiveness
comparatively [with a complicated circuit].
[0005] moreover — since a processing network other than the image-processing network of
writing is prepared and image display is carried out from reading with said conventional technique

— a circuit — complicated — not becoming — it did not obtain but, naturally cost was also high.

[0006] Moreover, as a full colour copying machine equipped with the image display device of the body **** attachment mold of a copying machine, only one side of a mono-electrochromatic display or a full color display was connectable. On the other hand, although a user has those who attach importance to image display quality, and those who give priority to cost, only either could be chosen and both were not able to be satisfied on said conventional technique by the same machine.

[0007] Moreover, by the former, even if it displayed the color conversion result on the mono-electrochromatic display, since it was displaying as it is, decision did not stick [whether the conversion result is correct and].

[0008] This invention was not made in view of the actual condition of such a conventional technique, and the 1st purpose is in offering the cheap image formation equipment of the cost in which the smooth display which a thin line does not go out and has gradation nature is possible.

[0009] The 2nd purpose is to offer the cheap image formation equipment of the cost which can attain communalization of a circuit.

[0010] The 3rd purpose is to offer user[who can choose a full color display and mono-electrochromatic display]-like image formation equipment.

[0011] The 4th purpose is to offer the image formation equipment which can display a transducer in the tone corresponding to the conversion color of color conversion, when the mono-electrochromatic display is connected.

[0012]
[Means for Solving the Problem] In order to attain the above-mentioned purpose, the 1st means A means to read a manuscript image, and a means to identify the alphabetic character section and the photograph section among the image data outputted by reading with this means to read, A means to thin out and process the image data outputted from said means to read, In the image processing system which has a means to display the image data which thins out and is outputted from means concerned to process, and changes said processing of a means to thin out and process, according to the output of said means to identify While thinning out and thinning [main scanning direction] out said means to process, in 1/n (n is a positive integer) about 1/m (m is a positive integer) and the direction of vertical scanning When said means to identify identifies the inside of the block of the matrix of mxn as it is an alphabetic character, A means by which transpose the central value of said block to maximum when larger data than a predetermined value exist beyond an appointed number within said block, and 0 replaces the central value of said block when there is less said data than an appointed number, If said means to identify identifies the inside of the block of the matrix of mxn as it is a photograph, it is characterized by thinning out, for said means to process having embraced the alphabetic character or the discernment condition of a photograph, shifting [to have the means which makes central value the result of having smoothed the data of said block,], and outputting that central value. A means for the 2nd means to carry out color correction processing of the RGB data read with a means to read a color picture, and the means concerned to read, and to change into YMCK, In the image processing system which it is outputted for every color from means concerned to change, and is outputted to edit processing, gradation processing, and the written-in means that carries out printer gamma amendment processing A means to display the color picture processed by the image read with said means to read, or said each processing, In case it displays on said means to display, after carrying out color correction processing with said means to change, it is characterized by having a means to dedicate and process the data width of face of 3 classification by color to the data width of face of one color, and to output to said display means.

[0013] A means for the 3rd means to carry out color correction processing of the RGB data read with a means to read a color picture, and the means concerned to read, and to change into YMCK, In the image processing system which it is outputted for every color from means concerned to change, and is outputted to edit processing, gradation processing, and the written-in means that carries out printer gamma amendment processing It is characterized by having a

means to display the color picture processed by the image read with said means to read, or said each processing, and a means to choose whether said color picture is displayed by the color picture, or it displays by monochrome image.

[0014] The 4th means is characterized by replacing and outputting the changed color to a tone, when it has a means to match a tone with the color changed by said means to change, in the 3rd means and the display of monochrome image is chosen by said means to choose.

[0015]

[Embodiment of the Invention] Hereafter, the operation gestalt of this invention is explained based on a drawing.

[0016] Drawing 1 is the block diagram showing the configuration of the image-processing section of the image formation equipment by this invention. Moreover, drawing 2 is the front view (about a part, it is a sectional view) showing the configuration of the device section of the image formation equipment by this invention, and drawing 3 is the outline block diagram of the image formation section by this invention.

[0017] First, the configuration of drawing 2 and drawing 3 is explained. The color picture recording device (henceforth a "color printer") 2 as a write-in means is installed in the lower part of the color picture reader (henceforth a "color scanner") 1 as a reading means. Moreover, the image formation equipment by this invention is equipped with the image display device 47.

[0018] Contact glass 4 is arranged in the top face of a color scanner 1 so that a manuscript 3 can be laid, and the optical scanner style is arranged in the interior. This scanner style is a configuration containing the mirror 6 (it has the lighting lamp 5 and integral construction) which reflects the reflected light (reading light) from the lighting lamp 5 (tubing-like lamp) for illuminating a manuscript 3, and the manuscript 3 at the time of lighting horizontally, whenever it carries out both-way migration of the manuscript 3 bottom once, the image data of one color is read, and it can obtain the image data of four colors by 4 times of repeats.

[0019] Furthermore, a mirror 7 is arranged on the outgoing radiation optical path of a mirror 6, and the mirror 8 for reflecting the light from a mirror 7 horizontally is arranged directly under this mirror 7. On the outgoing radiation optical path of this mirror 8, sequential arrangement of optical system 9 and the color sensor 10 is carried out. In addition, since arrangement and actuation of these light sources and mirror groups are well-known, detailed explanation is omitted.

[0020] The color sensor 10 changes image information into an electrical signal, and CCD (charge-coupled device) is used for optical – ********* and the concrete target on which reading can perform color picture information for every color separation of (Blue B) Green (G) and red (R). Moreover, the color-separation means of B, G, and R is attached. Color transform processing is performed by the image-processing section shown in drawing 1 based on the color-separation picture signal reinforcement of B, G, and R which were obtained by this color sensor 10, and black (Bk [K]), cyanogen (C), a Magenta (M), and the color picture data of yellow (Y) are obtained. A color copy can be obtained by developing this to Bk [K], Cyanogen C, Magenta M, and Yellow Y by the color printer 2.

[0021] Next, the configuration of a color printer 2 is explained.

[0022] The color printer 2 is equipped with the write-in optical unit 11. This optical unit 11 is equipped with each of a mirror 16 which reflects the laser beam from the motor 13 for rotating the polygon mirror 12 and this polygon mirror 12, a laser light source 14, the ftheta lens 15, and this ftheta lens 15 in the predetermined direction, and is constituted.

[0023] The photo conductor drum 17 is arranged by the lower part of the optical unit 11. It is continuously arranged so that the following members may take a round towards a hand of cut to the photo conductor drum 17, as this is surrounded. That is, each of the potential sensor 21 for detecting the electric-discharge lamp 19 for discharging the charge of the cleaning unit (the electric discharge machine before cleaning is included) 18 for removing the toner which remains on the front face of the photo conductor drum 17, and the front face of the photo conductor drum 17, the electrification machine 20 uniformly electrified to a photo conductor before exposure, and electrification level, the color developer 22, the development concentration pattern detector 23, and the middle imprint belt 24 is arranged.

[0024] The color developer 22 is equipped with the development counter of 4 classification by

color of the Bk (black) development counter 25, the C (cyanogen) development counter 26, the M (Magenta) development counter 27, and the Y (yellow) development counter 28. Moreover, the middle imprint belt 24 rotates in the condition of having been laid [firmly] across each of the imprint bias roller 29, the follower roller 30, and a driving roller 31 (it drives with a non-illustrated drive motor). Furthermore, the middle imprint belt 24 is made to adjoin and the belt cleaning unit 32 for removing the adhering toner etc. is arranged. Moreover, in order to arrange the paper imprint unit 33 in the location which counters a driving roller 31 and to carry in a transfer paper to this paper imprint unit 33 and the middle imprint belt 24 from the transfer paper cassettes 34, 35, and 36 (the transfer paper of different size is set to each), the conveyance way 38 containing the resist roller 37 is formed.

[0025] Furthermore, it is equipped with the transfer paper cassette 44 from the exterior, and also the lateral portion of a color printer 2 is equipped with the manual paper feed tray 45 on which an OHP form, pasteboard, etc. are set. Moreover, 46 is a transfer paper and 47 is a feed roller.

[0026] In order to convey the form which the imprint ended, the paper conveyance unit 39 is arranged at a level with the lower part of the color developer 22, and the fixing assembly 40 is arranged in the edge. A fixing assembly 40 is equipped with a fixing roller 41 and the pressurization roller 42, and makes space carry out melting fixing of the toner image with heat and a pressure. The copy paper which fixing ended is discharged out of equipment, and is sent out to the copy tray 43.

[0027] The optical unit 11 changes the color picture data from a color scanner 1 into a lightwave signal, forms the light beam corresponding to a manuscript image, exposes this to the part to which the photo conductor drum 17 was charged beforehand, and makes an electrostatic latent image form. The photo conductor drum 17 rotates to the counterclockwise rotation of drawing, and the development and an imprint of one color are performed by one rotation of this photo conductor drum 17. Moreover, paper is fed to an imprint form from either of the transfer paper cassettes, and even the resist roller 37 is sent out. Toner development of one color (this example black) is carried out by the color developer 22 in the process which the photo conductor drum 17 rotates to the part in which the electrostatic latent image was formed. If the middle imprint belt 24 is rotating to the photo conductor drum 17 and coincidence and the visible image by toner development arrives at the location of the imprint bias roller 29, as for a visible image (toner image), the image of the 1st color will be continuously imprinted by the middle imprint belt 24. Three kinds which carry out a postscript are in the approach, i.e., the approach of the middle imprint belt 24 of operation, of making the 2nd color − the 4th color imprinting.

[0028] Next, the configuration of drawing 3 is explained.

[0029] The color developer 22 equips the above-mentioned appearance with four development counters (the Bk development counter 25, the C development counter 26, the M development counter 27, and Y development counter 28), and each development counter has same composition. That is, the Bk development counter 25 is equipped with toner concentration detection sensor 25c for detecting development sleeve 25a which contacts the ear of a developer on the front face of the photo conductor drum 17, development paddle 25b which performs pumping and stirring of a developer, and the toner concentration of a developer, and is constituted. In addition, development sleeve 25a and development paddle 25b are constituted pivotable.

[0030] Similarly, the C development counter 26 is equipped with each of development sleeve 26a, development paddle 26b, and toner concentration detection sensor 26c, and is constituted, and the M development counter 27 is equipped with each of development sleeve 27a, development paddle 27b, and toner concentration detection sensor 27c, and is constituted, and the Y development counter 28 is equipped with each of development sleeve 28a, development paddle 28b, and toner concentration detection sensor 28c, and is constituted.

[0031] Moreover, the paper imprint unit 33 is equipped with exfoliation device 33c for exfoliating a transfer paper, and consists of paper imprint bias roller 33a, roller cleaning-blade 33b, and a middle imprint belt 24. Paper imprint bias roller 33a is usually estranged to the middle imprint belt 24.

[0032] Here, the development and the imprint after the 2nd color are explained. About actuation of the middle imprint belt 24, three kinds, a (1) 1 constant-speed **** method, (2) skip **** method, and (3) reciprocation (quick return) method, are in the above-mentioned appearance.

[0033] (1) After the belt imprint (the image imprint to the middle imprint belt 24 from the photo conductor drum 17 is said) of a 1 constant-speed **** method ** black toner image continues **** by fixed ** as it is.

[0034] ** When Bk image tip location on the 24th page of a middle imprint belt arrives at the belt imprint location of the contact section with the photo conductor drum 17 again, timing is taken and image formation is performed by the photo conductor drum 17 side so that the point of the cyanogen toner image which is the 2nd color may come to the location exactly. Thereby, a cyanogen image doubles a location with a black image correctly, and a belt imprint is carried out in piles on the middle imprint belt 24.

[0035] ** Also after that, by performing same actuation, it progresses to a Magenta and a yellow image process, and the belt transfer picture (color picture) of 4 color piles is obtained.

[0036] ** Carry out the package imprint of the 4 color pile toner image on the 24th page of a middle imprint belt (color picture) on a transfer paper 46, making it **** as it is succeedingly to the imprint to the middle imprint belt 24 of the yellow toner image of four amorous glance.

[0037] (2) After the imprint to the middle imprint belt 24 of a skip **** method ** black toner image is completed, and making the middle imprint belt 24 estrange from the front face of the photo conductor drum 17, making a high speed skip carry out in the **** direction as it is and moving the specified quantity, it is returned to the original **** rate. Moreover, the middle imprint belt 24 is re-contacted to the photo conductor drum 17 after that.

[0038] ** When the black image tip location on the 24th page of a middle imprint belt arrives at a belt imprint location again, the photo conductor drum 17 takes timing so that the point of the following cyanogen image may come to the location exactly, and image formation is performed. Thereby, alignment of the cyanogen image is correctly carried out to a black image, and it is imprinted in piles to the middle imprint belt 24.

[0039] ** After that, by same actuation, progress to a Magenta and a yellow image process and obtain the belt transfer picture (color picture) of 4 color piles.

[0040] ** Imprint 4 color pile toner image on the middle imprint belt 24 (color picture) collectively to up to a transfer paper 46 at a **** rate as it is after making the yellow toner image of four amorous glance imprint to the middle imprint belt 24.

[0041] (3) After the imprint of a reciprocation (quick return) method ** black toner image is completed, make the photo conductor drum 17 and the middle imprint belt 24 estrange, and carry out a high-speed return to hard flow further at the same time it stops ****. After the black image tip location on the 24th page of a middle imprint belt moves a part for the distance which passed through the belt imprint equivalent location to hard flow, and was set up further beforehand, it is made to stop, and this return is changed into a standby condition.

[0042] ** Next, when the point of the cyanogen toner image by the side of the photo conductor drum 17 arrives at a front predetermined location from the imprint location on the middle imprint belt 24, start the middle imprint belt 24 in the **** direction again. Moreover, the middle imprint belt 24 is again contacted to the 17th page of a photo conductor drum. It is controlled by conditions to which a cyanogen image laps with a black image correctly on the 24th page of a middle imprint belt also in this case, and the middle imprint belt 24 imprints.

[0043] ** Also after that, by same actuation, progress to a Magenta and a yellow image process and obtain the belt transfer picture (color picture) of 4 color piles.

[0044] ** Make it **** at a rate as it is, without carrying out a return, and carry out the package imprint of the 4 color pile toner image on the 24th page of a middle imprint belt (color picture) to a transfer paper 46, after making the yellow toner image of four amorous glance imprint to the middle imprint belt 24.

[0045] After a transfer paper is further sent out to the paper conveyance unit 39 after the package imprint of the toner image (color picture) of four colors was carried out from the 24th page of a middle imprint belt as mentioned above to the transfer paper 46 (carried out by rotating the resist roller 37 and sending out a transfer paper to the location of paper imprint bias

roller 33a), and fixing is subsequently performed by the fixing assembly 40, it is discharged to the copy tray 43.

[0046] On the other hand, in the photo conductor drum 17 side, whenever the imprint of one classification by color to the middle imprint belt 24 is completed, it is cleaned by the cleaning unit 18, and electricity is further discharged by homogeneity with the electric discharge lamp 19. Moreover, if it was in the middle imprint belt 24, after 4 color pile toner image is imprinted by the transfer paper, a belt front face is cleaned by the belt cleaning unit 32, and it prepares for the next copy.

[0047] In addition, in a repeat copy, actuation of a color scanner 1 and the image formation to the photo conductor drum 17 go into the black (one amorous glance) image process of the 1st sheet to predetermined timing following on the yellow (four amorous glance) image process of the 1st sheet. Moreover, if it is in the middle imprint belt 24, the belt imprint of the black toner image of the 2nd sheet is made to be carried out to the field cleaned in the belt cleaning unit 32 in the front face following on the package imprint process to the transfer paper of 4 color pile images (color picture) of the 1st sheet.

[0048] In addition, although the above explanation was the case where 4 color FURUKARA was obtained, actuation which described above only each **** of 3 color copy and 2 color copy, the specified color, and the count will be performed. Moreover, copy actuation will be performed in the condition [that carry out 1 constant speed drive in the **** direction while only the development counter of the color was made into the development operating state until the number of predetermined leaves was completed in the monochrome copy, and the middle imprint belt 24 had contacted the 17th page of a photo conductor drum, and the belt cleaning unit 32 has also contacted the middle imprint belt 24 further].

[0049] An image display device 47 is explained succeedingly.

[0050] When displaying the manuscript image read with the color scanner 1 as it is, the gamma correction of R and G which were obtained with the color scanner 1, and the B data is carried out, and they are outputted to an image display device 47 so that the property of infanticide processing and an image display device may be suited in the below-mentioned image-processing section 50. Generally, since the resolution of a color reproducing unit is high (there is much 400dpi.) and the resolution of an image display device has it (100dpi extent), this is because it is necessary to thin out and display. [low] Moreover, if an image display device 47 is a color, according to the property of an image display device 47, the gamma correction of a lightness signal or the luminance signal will be carried out, and chrominance signals, such as R, G, B, or L, a, b, will be outputted, if it is a mono-color. An image display device 47 displays the received picture signal on screens, such as CRT (Braun tube) or LCD (liquid crystal display).

[0051] The picture signal displayed on the screen touches the area which wants to change on the coordinate directions means which is not illustrated, for example, a touch pen appearance screen, and specifies area (the screen top is a touch panel.). Subsequently, contents to change are directed (for example, color conversion is carried out by color conversion at red.). Such a series of procedures are displayed on a screen with a menu etc. After a directions procedure is completed, the contents are notified to the image-processing section, and a parameter is set up according to the contents of modification.

[0052] If press actuation of the display switch is carried out to display a modification result on an image display device 47 as a result of not illustrating when such actuation is completed, a color scanner will read a manuscript image, the R and G, and B data will be processed by the image-processing section according to said parameter, and it will be outputted to an image display device 47, and will be displayed on a screen. Image display is attained by one reader of a color scanner.

[0053] An operator checks an image in a display screen and does press actuation of the copy switch which will not be illustrated if the contents of a display are sufficient. If a problem is in a display result, a series of above-mentioned activities will be done again. In addition, if there is no need for the display check of a modification result, a copy switch will be pushed after the above-mentioned Make Changes termination.

[0054] An image-processing system is shown in the block diagram of drawing 1 .

[0055] The image read station 1 consists of a color scanner as mentioned above, and outputs the image data R, G, and B (each color of 8 bits) of the read manuscript to coincidence. The outputted image data is amended in the image-processing section 50, and is outputted to the write-in section 2 and/or said image display device 47.

[0056] The profile configuration of the image-processing section 50 is carried out from gamma correction section (1)50-1, the color correction (color conversion) section 50-2, the editorial department 50-3, the filter section 50-4, the gradation processing section 50-5, gamma correction section (2)50-6, an alphabetic character, the photo finish section 50-7, the area signal generation section 50-8, the tone generation section 50-9, and the infanticide processing section 50-10.

[0057] The gamma correction section (1) 50-1 changes into a concentration linear (or lightness linear) B and R which are outputted from the image read station 1, and G data (reflection factor linear). The translation data is inputted into the color correction section 50-2, and an alphabetic character and the photo finish section 50-7.

[0058] An alphabetic character and the photo finish section 50-7 judge whether it is an alphabetic character field in a mxm unit like 4x4, or is a photograph field, it is owner ******, or it is an achromatic field from input data, and outputs the result to the color correction section 50-2. With the judgment result, 1:alphabetic character, 0:photograph, and the 1st of 2 bits are set up for the 0th bit like 1:owner ** and 0:achromatic here.

[0059] Color correction and color transform processing are performed in the color correction section 50-2. That is, although image reading is performed by R, G, and B, since image formation performs [the toner or ink of Bk, C, M and Y], it changes into Bk, C, M, and Y data from G, G, and B data according to (1) type.

[0060]
[Equation 1]

$$
\begin{pmatrix} C \\ M \\ Y \\ Bk \end{pmatrix} = \begin{pmatrix} r_1 & g_1 & b_1 \\ r_2 & g_2 & b_2 \\ r_3 & g_3 & b_3 \\ r_4 & g_4 & b_4 \end{pmatrix} \begin{pmatrix} R \\ G \\ B \end{pmatrix} + \begin{pmatrix} d_1 \\ d_2 \\ d_3 \\ d_4 \end{pmatrix}
$$

$\cdots (1)$

[0061] Multipliers r, g, and b and a constant d switch automatically by the hue parting plane of R, G, and B data by this (1) formula. Moreover, when changing into the color of arbitration, or the color of a request of a field, the above-mentioned multiplier and a constant are switched to a predetermined value. Here, about a field, it switches by the area signal from the area signal generation section 50-8 mentioned later. In this example, four signal lines are prepared and assignment has become possible up to 16 area.

[0062] The detail of the color correction section 50-2 is shown in <u>drawing 4</u> . Since the image data of one color is obtained by the scan of one scanner in a copy, in order to obtain a full color copy, it is necessary to scan 4 times. That is, by the 1st actuation, C component is generated by Bk [K] component and the 2nd scan, and 4th M component generates Y component at the 3rd time. By the 1st color transducer 50-21, by the 2nd time, it changes into M by C and the 3rd time, and R, G, and B data are changed into Y at the 4th time (input each color of 8 bits, output of 8 bits). In the 2nd color transducer 50-22, Bk is generated from R, G, and B data each time (input each color of 8 bits, output of 8 bits). At this time, each multiplier and constant are chosen from a constant and the multiplier register section 50-25 for every color. A constant and a multiplier are chosen using the hue parting plane judging information from the judgment section 50-24, the color component information for every scan, and area information.

[0063] In the UCR section 50-26, C and M which were outputted from the 1st color transducer 50-21, and Y data subtract Bk data generated by the 2nd color transducer 50-22, and are outputted. However, if an alphabetic character and a photograph seal Sadanobu number are achromatic in written form, output data are compulsorily set to 0. At the time of the 2-4th

scans, the 1st and the 2nd selection section 50-27, and 50-28 switch so that the above-mentioned data may be outputted, and at the time of the 1st scan, it switches so that the data Bk from the 2nd color transducer 50-22 may be outputted.

[0064] In order to carry out color display at the scan of one scanner, R, G, and B data are made to output through from the 1st thru/or the 3rd color transducer 50-21, 50-22, and 50-23, when an image display device 47 is a electrochromatic display in the case where a reading image is outputted to an image display device 47. this time -- through -- each constant and multiplier are chosen from a constant and the multiplier register 50-25 like. However, although, as for R, G, and B, a 8-bit output, i.e., an input, is outputted as it is, respectively, as for B, 2 bits of high orders of a 2-bit output, i.e., an input, are made to be outputted. R output data pass along the UCR section 50-26 by through, and they switch it so that this data may be chosen in the 1st selection section 50-27. And the high order triplet of this R data, the high order triplet of G output data, and (2 bits) of B output data are assigned to 8 bit data (high-order triplet: R, middle triplet:G, low order 2bit:B), and the 2nd selection section 52-28 is switched so that these data may be outputted.

[0065] Moreover, when an image display device 47 is a mono-color, it changes and outputs to a lightness signal or a luminance signal from R, G, and B data by the 1st color transducer 50-21, and this data is outputted through the UCR section 50-26, the 1st and the 2nd selection section 50-27, and 50-28 as it is.

[0066] When outputting the edit result of a reading image to an image display device 47, it is carried out by [as being the following]. When an image display device 47 is a color, the field which does not perform color transform processing makes R, G, and B data output through like the display of the above-mentioned reading image from the 1st thru/or the 3rd color transducer 50-21, 50-22, and 50-23. However, if the field which performs color transform processing is specified, to the field, each constant corresponding to a desired conversion color and a multiplier will be chosen from a constant and the multiplier register 50-25, and it will change and output to a desired color. In addition, assignment of a field that color transform processing is performed is identified with an area signal. Subsequent processing is the same as that of the case of the above-mentioned reading image display. moreover, when an image display device 47 is a mono-color If the field which the field which does not perform color transform processing changes and outputs the display of the aforementioned reading image to a lightness signal or a luminance signal from R, G, and B data by the 1st color transducer 50-21 similarly, and performs color transform processing is specified The tone signal matched with the conversion color specified to the field is chosen from the tone generation section 50-9, and the tone signal is replaced and outputted to data. Subsequent processing is the same as that of the case of said image reading display. Here, an example of correspondence of a conversion color and a tone signal is shown to drawing 5 .

[0067] The output data from the color correction section 50-2 are inputted into the image editorial department 50-3. The detail of this image editorial department 50-3 is shown in drawing 6 . Horizontal-scanning variable power of the case at the time of a copy and mono-color display is carried out in the 1st horizontal-scanning variable power section 50-31, and as it is, 5 bits of low order pass along the selection section 50-34 (1 is chosen.), a high order triplet is edited in the editorial department 50-35 of reversal and mirror - and others, and it is outputted. moreover, the case of a full color display -- R, G, and B -- horizontal-scanning variable power is carried out by each the 1st thru/or the 3rd horizontal-scanning variable power section 50-31, 50-32, and 50-33, consequently R (high order triplet) passes along G, B (5 bits of low order) passes along the selection section 50-34 (2 is chosen.) as it is, and it is edited and outputted in the editorial department 50-35. Moreover, it can edit according to the appointed area with an area signal. Since the editorial department 50-35 is not dependent on the mode (a copy, display) by bit autonomous working, its discernment according to mode is unnecessary.

[0068] The output of the image editorial department 50-3 is inputted into the filter section 50-4. The detail of this filter section 50-4 is shown in drawing 7 . In the filter section 50-4, at the time of copy mode, data is smoothed in the smooth section 50-41, and it is parallel, edge enhancement is carried out in the emphasis section 50-42, and it is inputted into the 1st

selection section 50-45. Among these, if it is a photograph, if "1" (data by which smooth was carried out) is an alphabetic character, "2" (edge enhancement was carried out) data are chosen, and it is outputted by an alphabetic character and the photograph seal Sadanobu number. And since this data is inputted into "1" of the 3rd selection section 50-47, "1" is chosen and outputted.

[0069] Moreover, representation decision processing is performed in the representation decision section 50-43 at the time of screen-display mode. This example explains the case where the reading image of 400dpi is thinned out in 100dpi. Then, since it thins out in horizontal scanning 1/4 and vertical scanning 1/4, 4x4 becomes one unit. The high order triplet of input data, a middle triplet, and 2 bits of low order are inputted into the representation decision R, the representation decision G, and the representation decision B of the representation decision section 50-43, respectively, and representation decision processing of 4x4 is performed independently, respectively. Here, the average is outputted to 4x4 blocks as central value. In parallel with this processing, central value is calculated in the representation decision section 40-44. The high order triplet of input data, a middle triplet, and 2 bits of low order are inputted into the representation decision R, the representation decision G, and the representation decision B like the above-mentioned, respectively, and if there are 4 and 4 or 2 or more data [four] within the block of 4x4 independently, respectively, central value of the block will be set to 7, 7, and 3, respectively. However, if it is three or less pieces, central value of the block will be set to 0, 0, and 0, respectively. Here, said threshold and the number can be set as arbitration. Moreover, processing at the time of this display mode is performed every 4x4 pixels, and central value is outputted continuously in the meantime.

[0070] Similarly [in screen-display mode], central value is inputted into the 2nd selection section 50-46, and if it is a photograph and it is "1" (smooth result data) and an alphabetic character, "2" (representation decision result data) is chosen and it is outputted by an alphabetic character and the photograph seal Sadanobu number, respectively. And since this data is inputted into "2" of the 3rd selection section 50-47, "2" is chosen and outputted.

[0071] Gradation processing is performed in the gradation processing section 50-5 after filtering. In copy mode, by the alphabetic character and the photograph seal Sadanobu number, if it is an alphabetic character field, through is carried out, input data is outputted as it is, and if it is a photograph field, gradation processing is carried out. Although the gradation expression of this gradation processing is carried out per block, since it is a well-known technique, explanation here is omitted. Moreover, if it is in screen-display mode, it will be made through irrespective of an alphabetic character photograph.

[0072] Termination of gradation processing performs gamma correction processing by gamma correction section (2)50-6. In the case of copy mode, this processing amends a printer property, and in more detail, the low concentration section is white, and if it is an alphabetic character field, the high concentration section is amended from middle so that it may become deep, so that an alphabetic character can be seen distinctly. Moreover, if it is a photograph field, it amends so that it may look smoothly from low concentration to middle and high concentration. And this amended data is outputted to the write-in section 2. Moreover, if it is in screen-display mode, it will amend and output so that the property of an image display device 47 may be suited.

[0073] In the area signal generation section 50-8, when not performing area processing, "0" is outputted. When area is specified by coordinate assignment, it writes in the 1st bit map which does not assign and illustrate an area number in the specified area. Moreover, when the area of a closed loop is specified, in order to detect a closed loop, the output data (data which took out only the MSB-edge) from gamma correction section (2)50-6 are incorporated to the 2nd bit map other than said 1st bit map which is not illustrated. A closed loop is detected from this data, and an area number is assigned and written in said 1st bit map. This written-in area data (4 bits) is outputted synchronizing with the image data explained so far.

[0074] The gamma correction section (2) Although the image data from 50-6 is inputted also into the infanticide processing section 50-10 and is outputted to an image display device 47, it is simply thinned out and outputted to horizontal scanning 1/4 and vertical scanning 1/4.

[0075] if an image display device 47 is a full color display -- 8 bits of input data -- all -- using -

- although -- a mono-color -- it is -- 8 bits -- a high order triplet is used inside.

[0076] The above example is the case where reading passing speed (rate of the direction of vertical scanning) of the scanner at the time of image display mode is made into the rate at the time of actual size. Naturally, if the reading passing speed of a scanner is increased 4 times at the time of actual size, as for infanticide processing, the representation decision section 50-43 and 50-44 will be set to 4x1 by horizontal scanning 1/4 and vertical scanning 1/1.

[0077]

[Effect of the Invention] Since this invention is constituted as above-mentioned, the effectiveness indicated below is done so.

[0078] Since the photograph section makes the smooth value of a block central value while it makes [according to invention according to claim 1] central value of a block of an infanticide unit into central value beyond an appointed number in a certain case, and they will set maximum to 0, if the data per infanticide with the larger alphabetic character section than a predetermined value do not have an appointed number, the smooth display in which a photograph has gradation nature is attained distinctly, without a thin line going out, as for an alphabetic character.

[0079] In case it displays on a means to display the color picture processed by the image or each processing read with the means to read, and a means to display according to invention according to claim 2, after carrying out color correction processing Since it has a means to dedicate and process the data width of face of 3 classification by color to the data width of face of one color, and to output to said display means, the processing network for a copy of the processing network for image display can be used, and image display becomes possible, without adding most circuits by this.

[0080] Since it has a means to display the color picture processed by the image read with the means to read, or said each processing, and a means to choose whether a color picture is displayed by the color picture, or it displays by monochrome image according to invention according to claim 3, according to a user's needs, color display or mono-color display can be chosen suitably.

[0081] Since the changed color is transposed to a tone and a transducer is displayed when according to invention according to claim 4 it has a means to match a tone with the changed color and the display of monochrome image is chosen, the color and field which are changed clearly can be judged.

[Translation done.]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the block diagram showing the configuration of the image-processing section of
the image formation equipment concerning the operation gestalt of this invention.
[Drawing 2] It is the front view showing the configuration of the device section of the image
formation equipment concerning the operation gestalt of this invention.
[Drawing 3] It is the outline block diagram of the image formation section.
[Drawing 4] It is the block diagram showing the detail of the color correction section in drawing
1 .
[Drawing 5] It is drawing showing correspondence with a conversion color and a tone signal.
[Drawing 6] It is the block diagram showing the detail of the image editorial department in
drawing 1 .
[Drawing 7] It is the block diagram showing the detail of the filter section in drawing 1 .
[Description of Notations]
1 Color Scanner (Color Picture Reader)
2 Color Printer (Color Picture Recording Device)
47 Image Display Device
50 Image-Processing Section
50-1 Gamma Correction Section (1)
50-2 Color Correction Section
50-3 Image Editorial Department
50-4 Filter Section
50-5 Gradation Processing Section
50-6 Gamma Correction Section (2)
50-7 Alphabetic Character and Photo Finish Section
50-8 Area Signal Generation Section
50-9 Tone Generation Section
50-10 Infanticide Processing Section

[Translation done.]

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1.This document has been translated by computer. So the translation may not reflect the original
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2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

[Drawing 1]